

Claims

- [c1] A pressure-activated valve for use with a container for dispensing fluid materials, the valve comprising:
- a base comprising a portion for covering an end of the container and a valve seat, the covering portion having an aperture;
 - a cap mounted to the base and comprising a side-wall, a flexible annular portion extending radially inward from the sidewall and terminating in a valve rim, the flexible portion being configured to flex downward when subjected to pressure from the container fluid material, and means for attaching the cap to the base such that the cap can be rotated with respect to the base; and
 - means for retaining the flexible annular portion in an un-flexed position;
- wherein rotating the cap causes the retaining means to disengage, enabling the flexible annular portion to flex downward when subjected to pressure from the container fluid material to expose an annular opening between the valve rim and the valve seat through which fluid may flow.

- [c2] The valve of claim 1 wherein the retaining means comprises a locking pin affixed to the base and a cam pin extending upward from the flexible annular portion and adapted to engage the locking pin.
- [c3] The valve of claim 2 wherein the base further comprises a neck portion defining a cylindrical space and extending axially downward from the periphery of the aperture and the valve seat is disposed within the cylindrical space and is affixed to the inner surface of the neck by bridges.
- [c4] The valve of claim 3 wherein the valve seat has a perimeter and further comprises a sidewall extending upward from its perimeter, and the locking pin extends radially outward from the valve seat sidewall.
- [c5] The valve of claim 4 further comprising a series of steps disposed around the valve seat sidewall and in engagement with the cam pin, wherein upon rotation of the cap the steps move the cam pin axially downward to create a gap between the valve rim and seat.
- [c6] The valve of claim 5 wherein the steps are configured to provide at least two different sized gaps between the valve seat and rim as the cap is rotated.
- [c7] The valve of claim 6 wherein the cap comprises multiple

cam pins extending upward from the flexible annular portion and the base comprises multiple sets of steps arranged around the valve seat sidewall in engagement with the cam pins.

- [c8] The valve of claim 1 wherein the valve seat is dish-shaped.
- [c9] The valve of claim 1 wherein the base further comprises a sidewall extending downward from the periphery of the covering portion.
- [c10] The valve of claim 1 wherein the base further comprises a flange extending radially outward from the bottom of the base sidewall.
- [c11] The valve of claim 1 further comprising a nozzle extension adapted to fit onto the cap.
- [c12] A pressure-activated valve for use with a container for dispensing fluid materials of varying viscosities, the valve comprising:
 - a base comprising a covering portion for covering an end of the container and having a centrally disposed aperture, a neck portion extending axially downward from the periphery of the aperture, and a center element connected to an inner surface of the neck by bridges, the center element comprising a valve seat,

a sidewall extending upward from the periphery of the valve seat and a locking pin extending radially outward from the center element sidewall; and a cap rotatably mounted over the neck and comprising a sidewall, a flexible annular top portion extending radially inward from the sidewall and terminating in a rim, means for attaching the cap to the base such that the cap can be rotated with respect to the base, and a cam pin extending upward from the flexible annular portion and having a groove adapted to engage the locking pin to prevent the flexible annular portion from flexing downward; wherein rotating the cap causes the cam pin to disengage from the locking pin, thereby enabling the flexible annular portion to flex downward when subjected to a predetermined amount of pressure from the container fluid material to expose an annular opening between the rim and the dish-shaped valve seat through which fluid may flow.

[c13] The pressure-activated valve of claim 12 wherein the center element further comprises steps disposed around the center element sidewall, the steps engaging the cam pin and configured to provide at least two discrete flow settings when the cap is rotated, including:

a first setting wherein the rim is seated on the dish-

shaped valve seat but can be lowered in response to pressure from the contents of the container to dispense fluid; and
a second setting wherein the rim is displaced downward a first discrete distance from the dish-shaped valve seat, exposing an annular opening therebetween for dispensing a higher viscosity fluid.

- [c14] The pressure-activated valve of claim 13 wherein the steps are configured to provide a third discrete setting in which the rim is displaced downward a second discrete distance from the dish-shaped valve seat greater than the first discrete distance, for dispensing an even higher viscosity fluid.
- [c15] The valve of claim 12 wherein the valve seat is dish-shaped.